UNITED STATES DEPARTMENT OF AGRICULTURE

# FOREST SERVICE

S

January 5, 1940

PLANTING - Medicine Bow
Nurseries
(Pole Mountain)

ANNUAL NURSERY REPORT

FOR

1939

S

PLANTING

Nurseries, Medicine Bow

(Pole Mountain)

January 5, 1940.

# ANNUAL NURSERY REPORT

for

1 9 3 9

## POLE MOUNTAIN NURSERY

## MEDICINE BOW NATIONAL FOREST

January 1, 1939 to December 31, 1939

Approved

J.S. VEEDER Forest Supervisor

Respectfully Submitted

B.J.ABRAHAMS Forest Ranger

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S
PLANTING
Nurseries
Pole Mountain

Pole Mountain Nursery
January 5, 1940.

# ANNUAL NURSERY REPORT

## POLE MOUNTAIN NURSERY
## FOR
## 1 9 3 9

## 1. Capacity

(a) Area in seedlings, transplants, soiling crops, and idle land available for nursery beds.

| Species | Area in square feet | | | | | |
|---|---|---|---|---|---|---|
| | Seed Beds° | | | | Transplants°° | |
| | 1-0 | 2-0 | 3-0 | 0-0 | 2-1 | 3-1 |
| Pinus Ponderosa | 4594 | 4568 | | | 12,278 Pole Mt. | |
| Pinus Contorta | 193 | 517 | | | 1,050 " " | |
| Pseudotsuga Tax. | 578 | 578 | 792 | | | |
| Picea Engelmannii | 193 | 193 | 264 | | | 1,568 Pole Mt. |
| Picea Pungens | 193 | 193 | | | | |
| J. Scopulorum | 772 | | | 193 | | |
| Totals | 6523 | 6049 | 1056 | 193 | 13,328 | 1,568 |

| | |
|---|---|
| Square Feet in Nursery Beds | 28,713 |
| Square Feet in soil crops | 50,125 |
| Idle land available for beds | 51,356 |
| Total Cultivated Land | 130,194 Sq. Ft. |

° Includes 27% of area for paths, but not roads. (4' beds, 14" paths)
°° Includes 9½% of area for paths, but not roads. (6' beds, 12" Paths)

(b) Possible capacity of nursery by class of stock based on present total nursery grounds:

Summary

| Area in Acres | | | | Ultimate production M Plants°° | | | |
|---|---|---|---|---|---|---|---|
| Unavailable for beds ( Lawns - Buildings ) | Available for beds: In Use | Available for beds: Idle | Total Area Nursery | Present | Approved | Possible | |
| 8.53 | 1.82 | 1.17 | 11.52 | 487.7 | 280.0 | 400.0 | 1-0 |
| | | | | 473.8 | 280.0 | 400.0 | 2-0 |
| | | | | 37.1 | | | 3-0 |
| | | | | 250.3 | 280.0 | 400.0 | 2-1 |
| | | | | 14.6 | | | 3-1 |
| | | | Total | 1263.5 | 840.0 | 1200.0 | M |

° Irrespective of crop rotation. Includes paths, but not roads.

°°Crop rotation as follows considered:

| Seedling Area | Transplant Area |
|---|---|
| Trees 2 years | Trees 1 year |
| Soil Crop 1 year | Soil Crop 1 season |
| Fallow 1 year | Fallow over winter |

(c) Approved production plan for remainder of nursery existance:

| Species | Age Class | 1940 | 1941 | 1942 |
|---|---|---|---|---|
| Pinus Ponderosa | 2-1 | 200 M | 200 M | 0 |
| Pinus Contorta | 2-1 | 40 M | 40 M | 0 |
| Pseudotsuga Taxifolia | 2-1 | 40 M | 40 M | 0 |
| Totals° | | 280 M | 280 M | 0 |

This output approved by the Chief in May 1933, But since then the nursery has been authorized to cease production. On the basis of making 1940 the last year in which transplanting will be done at Pole Mountain, no prod-

uction is indicated beyond 1941. The presenrt plan is to produce transplants with the 2-0 stock on hand for 1941 production, and the present 1-0 stock is to be shipped to the Monument Nursery for transplanting in the spring of 1941; leaving the Pseudotsuga Taxifolia stock to be planted from Pole Mountain as 3-0 in 1942, and shipping the 3-0 Picea Engelmanii to Monument for the production of 3-1 transplants.

(d) Nursery stock on hand at close of year.

( See Form 132, next page )

Form 132
(Revised July 1, 1912)

UNITED STATES DEPARTMENT OF AGRICULTURE
FOREST SERVICE

# NURSERY STOCK ON HAND

POLE MOUNTAIN NURSERY MEDICINE BOW NATIONAL FOREST September 24 (Date of estimate), 1939

| SPECIES | NUMBER OF M. | YEARS IN SEED BED | YEARS IN TRP. BED | SOURCE OF SEED | HEIGHT | CONDITION |
|---|---|---|---|---|---|---|
| Pinus Ponderosa | 349.4 | 1 | 0 | Bailey, Pike N.F. | 2" | Excellent |
| Pinus Contorta | 16.7 | | | Pole Mountain | 1½" | " |
| Pseudotsuga Taxifolia | 38.6 | | | Pole Mountain | 1½" | " |
| Picea Pungens | 15.4 | | | French Cr. Med.Bow | 1" | " |
| Picea Engelmannii | 15.8 | | | Brooklyn Lk. " " | 3/4" | " |
| J. Scopulorum | 51.8 | | | Pole Mountain | 2" | " |
| Total | 487.7 | 1 | 0 | | | |
| Pinus Pomderosa | 383.4 | 2 | 0 | Bailey, Pike N.F. | 4" | excellent |
| Pinus Contorta | 31.3 | | | Pole Mountain | 3½" | good(uneven) |
| Pseudotsuga Taxifolia | 30.8 | | | Pole Mountain | 3½" | Good |
| Picea Pungens | 12.4 | | | Keystone,Med.Bow | 3" | Excellent |
| Picea Engelmannii | 15.9 | | | Brooklyn Lk." " | 2½-3½" | Excellent |
| Total | 473.8 | 2 | 0 | | | |
| Picea Engelmannii | 12.0 | 3 | 0 | Pole Mountain | 3"-7" | Excellent |
| Pseudotsuga Taxifolia | 25.1 | | | Pole Mountain | 4"-8" | Excellent |
| Total | 37.1 | 3 | 0 | | | |
| Pinus Ponderosa | 228.7 | 2 | 1 | Pole Mountain | 5½" | Excellent |
| Pinus Contorta | 21.6 | | | Fox Park,Med.Bow | 5½" | Good(uneven) |
| Total | 250.3 | 2 | 1 | | | |
| Picea Engelmannii | 14.6 | 3 | 1 | Keystone,Med.Bow | 5"-12" | Excellent |
| | | | | | | |

Total trees on hand all classes 1,263.5 M

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(Name)

Forest Ranger
(Title)

January 5, 1940
(Date of report)

U. S. GOVERNMENT PRINTING OFFICE: 1932

2. Water System.

(a) Amounts of water used, source and method of distribution:

This year practically all water which the trees in the nursery received was by overhead sprinklers. The year was an exceptionally dry one, and only a few beneficial rains were recorded. The upper spring went dry early in June and no water was forthcoming thereafter from this source. However, the water developed below the nursery area was well able to take care of all the watering needs the entire season.

Transplants were watered approximately four hours evrey day from the time of transplanting until June 26, and evrey other day until time to start hardening off for the winter. The 2-0 seedling beds were also watered for a period of four hours a day during the spring growing season and then every other day until time to harden them for winter. The germinating beds were given a light watering in the morning and again in the evening until germination was well along. The beds were then given increased amounts until a maximum of three hours a day was reached. They were watered at the latter rate until the early part of August and then watered every other day.

All watering was done with the overhead sprinkler system which is turned by oscillators. There was no shortage of water this year as the new development completed last year was capable of supplying all our needs for the trees as well as the CCC side camp and the residence needs.

(b) How amounts are applied and times of watering are determined:

The method of testing for the moisture needs of the beds was the same as the past year, namely the use of the surveyors pin. Losses were very low considering the drouth and the resultant lowering of the water table.

Watering this year had to be changed somewhat due to days of excessive heat and exceptionally cold nights. The highest daily range in temperature in June was 46°, in July 44°, and in August 40°. In June we experienced a low of 20°. This occured on the 10th. It was these conditions which made it necessary to do a good part of the watering during the day. This took more water, but it is felt that the trees developed as they should. Freezing night temperatures were felt every month this season. All water had to be pumped.

(c) Recommended changes in system:

No changes are deemed necessary, but it will depend on the conditions just what time of day watering will be done.

3. Seedlings

(a) Fertilizing:

No areas were fertilized, and no soil crops were planted on the seedling areas as no seed sowing is contemplated.

(b) Preperation of beds:

No seedling beds were prepared this year.

(c) Sowing and sowing data:

Spring 1939, None.

Fall 1939, None.

(d) Table of Sowing 1939, None

(e) Germination of seed sown fall 1938:

| Species | Date of sowing | Germination per square foot | | |
|---|---|---|---|---|
| | | Expected | Afeter Germination | End season |
| Pinus Ponderosa | 10/5/38 | 100 | 101 | 101 |
| Pinus Contorta | 10/7/38 | 100 | 106 | 116 |
| Pseudotsuga Taxi. | 10/7/38 | 90 | 94 | 90 |
| Picea Engelmanni | 10/7/38 | 100 | 106 | 109 |
| Picea Pungens | 10/7/38 | 100 | 106 | 107 |
| J. Scopulorum | 10/7/38 | 75 | 74 | 78 |
| J. Utahensis ° | 10/7/38 | 75 | | |

° Only a few seed germinated, but expect full germination spring 1940.

The above germination figures indicate that all beds averaged at least the number sown for at the end of the season. No losses from rodents during the winter or period of germination in the spring occured. There was a slight loss from damping off, but a little delayed germination made up for this loss. A good estimate of the damping off losses in the seed beds would be approximatly one percent. Check plots ran very good for initial germination, but the losses from damping off amounted to approximately 6.2% for ponderosa pine, 8.4% for douglas fir, 5% for engelman spruce, 3.6% for Blue spruce, and in lodgepole no appreciable difference could be found. No losses could be noted in the Cedar.

(f) Shading.

Due to the results of the experiments in shading of the seedlings last year it was decided to shade the 1-0 seedlings the entire season. Good results were obtained in the developement of the stock. It is not so much that the trees are shaded from the sun as it is the fact that it acts to prevent the night temperatures from dropping as much as it would without the shading. In conjunction with the shading the end boards are put on early in the evening. It has been found that the variation in the temperatures at night between the shaded beds and the outside air is as much as 8°. A ten day average was found to be 6°.

In the 2-0 beds the protective shading was removed June 15 and no shade was given these beds until they were covered for the winter, with the exception of the spruce and fir beds. The latter were shaded the entire season. In the 3-0 beds shading was removed July 1.

It was interesting to note that the 2-0 ponderosa pine beds which had been shaded as an experiment last year carried the difference in developement thru the second year.

(g) Watering.

All wtering was by overhead sprinklers. No water was applied prior to the removal of the winter mulch. After the mulch was removed the beds were watered one hour in the morning and one hour in the evening. This was done until germination was practically completed, after which the water was increased to three hours daily. The 2-0 beds were watered for four hours every day until the middle of the summer and then were watered for four hours every other day. Actual precipitation was so short that practically all watering this year was by sprinklers.

(h) Cultivation.

Seedlings are not cultivated at this nursery.

(i) Root Pruning.

No root pruning has been done at Pole Mountain in the past, but we are securing a tree digger and pruner from the Monument Nursery next spring and it will be used to root prune and dig the 2-0 stock at the time of transplanting. Also as an experiment, some 1-0 beds will be root pruned early in the spring.

(j) Weeding.

Weeding is all done by hand. weeds were kept well in hand by keeping a couple of CCC boys on this job as it was found necessary. Only those beds which are not to be dug for shipment or transplanting were given the final weeding. This was done at the time the bed counts were made.

(k) Mulching.

As no fall seed sowing was done this year no mulching of seed sown beds was needed. In the 1-0 and 2-0 beds only the spruce and fir beds are mulched with a pine needle mulch. The mulch is applied over the trees supported by the slatting. The mulch is applied approximately four inches thick and is prevented from falling thru the slatting by spreading burlap over the slatting first. All other trees are protected by protective frames which are raised above the trees by placing them on top of 2 X 4's. The slatting has been found to break the wind and also to trap snow.

(l) Size and developement of seedlings by species and age classes.

See Form 132, page 4 of this report.

(m) Injuries and their treatment.

1. Frost. Some slight losses from frost were felt this year, but it was limited to the Douglas fir and lodgepole pine 2-0 beds. No damage or losses occured in the 1-0 beds. The damage and loss was due to a severe freeze the 10th of June. The beds were covered with canvas but the drop was too much. The weather records show that the temperature dropped from a high of 59°to a low of 20° inside of two hours. It remained at this low temperature until the following afternoon when it raised to 34°. It dropped to 25 again that night. It is not known just why the 1-0 seedlings which were just germinating did not suffer, and the 2-0 which had the buds opened did suffer. The beds were all covered alike. In the 3-0 douglas fir no protective cover was applied and here no loss occured, but some killing back was found.

2. Disease.

Damping off losses were held to be negligible, being approximately only one percent. However the check plots show that if the beds had not been treated a severe loss would have been the case. The amounts of acid applied seem to be successful in controling the damping off losses.

3. Mice and other rodents. No trauble from mice or other rodents was experienced this year. This no doubt was due to the poisoning and trapping program carried out. Gophers did not bother us in the bed areas, but were numerous in the idle areas. A war was waged on them with both lead and other poison. Very little trouble is encountered with them in the bed areas, and it is thought that this is due to the fact that the ground is too moist.

(n) Losses and excess germination and their effects on the production schedule:

The production of 1-0 seedlings is well ahead of the present authorized production for this nursery and this is due to the fact that the practices at the nursery have been improved. The number while above the authorized production will give us a chance to cull for the best possible stock. The number of 1-0 seedlings on hand as shown by the fall inventory, should

produce at least 400 M transplants, After deducting for loss in the beds and for culling.

The production of stock available for the field in 1941 will also be well above the authorized output. Allowing for the loss in the beds and culling it is expected that here also at least 400 M plants will be produced.

Losses in the transplant beds will be discussed under transplants.

Probable production and deficit
of transplant stock in 1941

| Present Age Calss | Species | Quantity on Hand | Expect. Loss % | Probable product. M | Quantity desired M | Deficit M | Excess M |
|---|---|---|---|---|---|---|---|
| 2-0 | Pinus ponderosa | 383.4 | 10 | 345.1 | 230.0 | | 115.1 |
| | Pinus contorta | 31.3 | 10 | 28.2 | 25.0 | | 3.2 |
| | Pseudotsuga Tax | 30.8° | 10 | 27.8 | 25.0 | | 2.8 |
| | Picea Engelmannii | 15.9°° | | | | | |
| | Picea pungens | 12.4°° | | | | | |
| 3-0 | Picea Engelmanii | 12.0°°° | 10 | 10.8 | | | 10.8 |
| | Total | 457.5 | | 411.9 | 280.0 | | 131.9 |

° To be produced as 3-0 stock.
°° To be held for production of 3-1 stock 1942.
°°°to be produced as 3-0 stock 1941.

Probable production and deficit
of transplant stock in 1942

| Present age Class | Species | Quantity on hand | Expect loss % | Probable product. M | Quantity desired M | Deficit M | Excess M |
|---|---|---|---|---|---|---|---|
| 1-0 | Pinus ponderosa | 349.4 | 10 | 314.5 | 200.0 | | 114.5 |
| | Pinus contorta | 16.7 | 10 | 15.1 | 12.0 | | 3.1 |
| | Pseudotsuga Tax | 38.6° | 10 | 34.8 | 30.0 | | 4.8 |
| | Picea Pungens | 15.4°° | | | | | |
| | Picea Engelmannii | 15.8°° | | | | | |
| | J.Scopulorum | 51.8 | 10 | 46.7 | 25.0 | | 21.7 |
| 2-0 | Picea Engelmannii | 15.9°°° | 10 | 14.5 | 7.0 | | 7.5 |
| | Picea Pungens | 12.4°°° | 10 | 11.2 | 6.0 | | 5.2 |
| | Total | 484.8 | | 436.8 | 280.0 | | 156.8 |

° To be produced as 3-0 stock at Pole Mt.
°°To be grown at Pole Mt. until 3-0, and sent to Monument to be produced as 3-1 stock. Will be sent to Monument spring 1942.
°°° To be shipped to Monument spring of 1941 for production of 3-1 stock.

(o) Recommended changes in seedling culture:

As no more trees are to be raised at this nursery the present practices should be followed for the duration of the nursery. The principal things to follow will be the winter protection for the various species, watering practices etc.

(p) Sowing schedule for the coming year:

No seed sowing was done this year and none is anticipated for the future.

4. Transplants.

(a) Fertilizing.

Fertilizing of transplant areas is limited to soiling crops such as field peas and oats, and winter rye grown on the areas. The transplants otherwise are not fertilized.

(b) Preperation of transplant area.

As early in the spring as possible the area is plowed, disced, and floated, and made as near level as possible and practicable.

(c) Method of transplanting.

The area in which transplanting is to be done is staked as soon as the ground is properly prepared. The beds are laid out on the basis of 6' X 36' for the actual beds with a 12" path. The beds are laid out so that three beds with the paths are on each side of the sprinkler lines. The cross paths between the lengths of bed are two feet wide to give the necessary working room and for drainage. Steel tapes are stretched as a guide, and the tapes have alternate copper and brass markers spaced six inches apart. The Yale transplant board is used, and the trenches are all made with a steel hand trencher.. The transplant crew consists of five men as follows:

| | |
|---|---|
| 2° | Threaders |
| 1 | Trencher |
| 1 | Boardman |
| 1 | Tender |

° Sometimes it is necessary to put three men in the coop to thread if the boardman is experienced.

(d) Watering.

The transplants are watered as soon as possible after transplanting so that the trees can not become dry. A hand hose is used to water the trees close behind the last row of trees planted. As soon as a section is planted the overhead line is installed and the trees given a good watering. The trees are watered every day during the early growing season and then the water is put on every other day and depending on the amount of natural precipitation in the form of rain. The actual need for water during the summer is determined by the use of the surveyors pin. This method has given very good results and has been adopted as standard practice.

(e) Cultivation.

Transplants are not cultivated.

(f) Root pruning.

Transplants are not root pruned.

(g) Weeding.

Weeding is all done by hand as required. This year two CCC boys were used whenever it was felt necessary and the beds looked good at all times.

(h) Mulching.

Mulching of the transplants was limited to the spruce and fir. The pine needle mulch was put on top of slatting supported on 2 X 8's. As in the seedlings the slatting was covered with burlap prior to spreading the pine needle mulch. This mulch was applied to a depth of approximately four inches and the mulch was then wet down by the overhead sprinklers to keep the mulch from blowing off and to keep it moist. All other species are protected for the winter by covering them with slatting supported well above the trees on 2 X 8's. The upper end of the beds are closed in also, but the lower ends are left open for drainage.

(i) Size and developement of transplants by species and age classes.

See Form 132, page 4 of this report.

(j) Density at time of transplanting and at time of inventory in fall.

| Species | Source | At time of transplanting: per sq. ft. | At close of season: per sq. ft. | % loss |
|---|---|---|---|---|
| Pinus ponderosa | Pole Mountain | 20.60 | 19.80 | 3.9 |
| Pinus Contorta | " " | 20.60 | 20.23 | 1.8 |
| Picea Engelmannii | " " | 10.30 | 10.16 | 1.4 |
| Average (weighted) | | 20.05 | 19.33 | 3.6 |

(k) Injuries and their treatment.

No unusual losses occured. The loss in the ponderosa pine would not have been as much had not a bunch of trees been transplanted which showed signs of yellowing due to a root rot. When the fall counts were made allowance was made for these trees. No damage from frost was noted in the transplants. Damage to transplants from deer is very slight. The damage consists of the trees being cut by the feet of the deer. No nipping of the tops has ever been found.

(l) Losses and their effect on the production schedule and planting plans.

As indicated by the figures on Form 132, the production next spring is

well able to take care of the authorized production. It is expected that after the trees are culled for size and poor roots at the time of distribution that the number available for field planting will be just a few M above the number authorized. On the basis of the number of trees culled this spring that the number avilable will be approximately 284 M. This amount of stock should be able to plant approximately 450 acres.

(m) Recommended changes in transplant culture.

A tree digger is to be used this year for the first time at this nursery and it is felt that the cost of transplanting will be reduced. It is planned to have the crew digging trees for transplanting also cull out the small stock, and any damaged trees at the time of digging. Trees will be boxed ready for the use of the threaders.

The method used last year of placing the trees directly in the boxes as they are dug was used again this year. This method prevents the roots from becoming dry as the trees are transplanted the same day. Care must be taken to see that the packers get the roots in the burlap and that they are kept moist.

(n) Table of stock transplanted spring 1939.

| Species | Quantity | Age Class | Nursery fro which obtained. |
|---|---|---|---|
| Pinus ponderosa | 238.0 M | 2-0 | Pole Mountain |
| Pinus contorta | 22.0 M | 2-0 | Pole Mountain |
| Picea Engelmannii | 14.8 M | 3-0 | Pole Mountain |
| Toatal | 274.8 M | | |

(o) Table of stock to be transplanted spring 1940.

| Species | Quantity | Age Class | Nursery from which obtained. |
|---|---|---|---|
| Pinus ponderosa | 383.4 M | 2-0 | Pole Mountain |
| Pinus contorta | 31.3 M | 2-0 | Pole Mountain |
| Picea Engelmannii | 12.0 M | 3-0 | Pole Mountain |
| Total | 426.7 M | | |

5. Stock Distribution.

(a) Lifting.

Lifting of trees for distribution is still done by hand, and with the present plans it is not felt necessary to secure a digger for this phase of the work.

(b) Culling.

This year for the first time trees were culled for both size and root system developement. As the trees were dug they were brought into the equipement shed where a table 4' X 12' had been erected. The top of the table was covered with six layers of burlap and was kept moist at all times. The process of culling was done by having the men place the culls in one pile and the acceptable trees in another pile. In this way a check could be made to see if the culling was being done properly. Eight men were kept on this job, and in addition one man was used to take the good trees and wrap them in bundles of approximately 50 per bundle. The bundles were then packed in the boxes with layers of moss for shipment to the field.

At each mans place two finishing nails were set so that proper top length could be measured for if necessary. It was also used for the first hundred trees in the morning and after dinner. Trees were graded in accordance with a standard set up by the region. This standard called for a top minimum of 2½", but as we did not have this particular standard at the time a three inch standard was set up. It is felt that a very good job of culling was done, but it seemed rather slow and expensive.

(c) Packing.

All trees for the Medicine Bow projects were packed in the Nebraska type boxes as in the past. The boxes were lined with waterproofed burlap and the trees, which were bundled at the nursery, were laid in layers with wet moss between each layer of bundles. Trees shipped to other forests are baled in waterproof burlap and protected by the use of 1 X 4's on the outside.

(d) Shipping.

Trees were trucked directly to the planting job on the Medicine Bow. for shipments to other forests some were trucked, and some sent by express.

(e) Recommended changes in distribution.

It is planned to discard trees at the time of transplanting which it is thought will not meet the requirements for top developement. This will leave the culling strictly one of root developement, and should speed the work and cut down the costs. No other changes are recommended at this time.

(f) Table of Nursery stock distributed spring 1939.

See Form 150, following.

(g) Table of nursery stock shipped fall 1939.

No fall distribution as conditions were not favorable due to lack of sufficient moisture.

(h) Table of nursery stock available for distribution spring 1940.

See Form 150. following.

(i) Table of stock available for distribution fall 1940.

None contemplated unless conditions warrent. If at all possible it is hoped to be able to get the spruce and fir species planted to save on winter protection needs at the nursery.

Form 150
(Revised July 1, 1912)

UNITED STATES DEPARTMENT OF AGRICULTURE
FOREST SERVICE

# NURSERY STOCK DISTRIBUTED

Pole Mountain Nursery Medicine Bow National Forest Spring (Season), 1939

| FOREST SENT TO | NUMBER OF M | SPECIES | YEARS IN | | SOURCE OF SEED | COST PER M | | |
|---|---|---|---|---|---|---|---|---|
| | | | SEED BED | TRANS-PLANT BED | | STOCK | STOCK DISTRIBU-TION | TOTAL |
| Medicine Bow | | | | | | | | |
| Pole Mountain | 179.8 | Pinus ponderosa | 2 | 1 | Pole Mountain | 12.79 | .80 | 13.59 |
| " " | 48.6 | Pinus ponderosa | 2 | 2 | Pike N.F. | 11.43 | .80 | 12.23 |
| " " | 5.6 | Pseudotsuga Tax | 2- | 1 | Pole Mountain | 23.03 | .80 | 23.83 |
| " " | 15.2 | Picea Pungens | 2 | 1 | French Cr. Med Bow | 11.76 | .80 | 12.56 |
| Centennial | 52.7 | Pinus contorta | 2 | 1 | Pole Mountain | 12.75 | .80 | 13.35 |
| Fox Park | 8.3 | J. Scopulorum | 2 | 1 | Newcastle Wyo. | 11.71 | .80 | 12.51 |
| " " | 6.0 | Picea Engelmannii | 2 | 2 | Keystone, Med Bow | 16.21 | .80 | 17.01 |
| Med. Bow Landscape | 1.2 | J. Scopulorum | 2 | 1 | Newcastle, Wyo. | 11.71 | .80 | 12.51 |
| Roosevelt N.F. | 50.0 | J. Scopulorum | 2 | 1 | Newcastle, Wyo. | 11.71 | 1.38 | 13.09 |
| Rio Grande N.F. | 25.0 | J. Scopulorum | 2 | 1 | Newcastle Wyo. | 11.71 | 1.38 | 13.09 |
| Total | 392.4 ✓ | | | | | | | |

Bernard J. Abrahams
(Name)

Jan. 5, 1940, 193
(Date of report)

Forest Ranger
(Title)

U.S. GOVERNMENT PRINTING OFFICE 8—9054

Form 150
(Revised July 1, 1912)

UNITED STATES DEPARTMENT OF AGRICULTURE
FOREST SERVICE

# NURSERY STOCK DISTRIBUTED

Pole Mountain Nursery Medicine Bow National Forest Spring (Season), 1940, 193

| FOREST SENT TO | NUMBER OF M | SPECIES | YEARS IN SEED BED | YEARS IN TRANSPLANT BED | SOURCE OF SEED | COST PER M STOCK | COST PER M STOCK DISTRIBUTION ° | COST PER M TOTAL |
|---|---|---|---|---|---|---|---|---|
| | 228.7 | Pinus ponderosa | 2 | 1 | Pole Mountain | 6.40 | .91 | 7.31 |
| | 21.6 | Pinus contorta | 2 | 1 | Fox Park, Med. Bow | 7.33 | .91 | 8.24 |
| | 14.6 | Picea engelmannii | 3 | 1 | Keystone, Med. Bow | 11.00 | .91 | 11.91 |
| | 25.1 | Pseudotsuga Tax | 3 | 0 | Pole Mountain | 3.21 | .91 | 4.12 |
| Total | 290.0 ✓ | | | | | | | |

° Based on cost of culling and other distribution costs to Medcine Bow projects. For distribution to other forests add $0.42 per M

BERNARD J. ABRAHAMS
(Name)

Forest Ranger
(Title)

January 5, 1940, 193
(Date of report)

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(j) Summary of stock distributed spring 1939.

| Species | M Plants | | | | |
|---|---|---|---|---|---|
| | Forest Service | | Cooperative | | |
| | Seedlings | Transplants | Seedlings | Transplants | Total |
| Pinus ponderosa | 0 | 228.4 | 0 | 0 | 228.4 |
| Pinus contorta | 0 | 52.7 | 0 | 0 | 52.7 |
| J. Scopulorum | 0 | 84.5 | 0 | 0 | 84.5 |
| Pseudotsuga Tax. | 0 | 5.6 | 0 | 0 | 5.6 |
| Picea pungens | 0 | 15.2 | 0 | 0 | 15.2 |
| Picea engelmannii | 0 | 6.0 | 0 | 0 | 6.0 |
| Total | 0 | 392.4 | 0 | 0 | 392.4 |

(k) Summary of stock available for distribution spring 1940.

| Species | M Plants | | | | |
|---|---|---|---|---|---|
| | Forest Service | | Cooperative° | | |
| | Seedlings | Transplants | Seedlings | Transplants | Total |
| Pinus ponderosa | 0 | 228.7 | 0 | 0 | 228.7 |
| Pinus contorta | 0 | 21.6 | 0 | 0 | 21.6 |
| Picea engelmannii | 0 | 14.6 | 0 | 0 | 14.6 |
| Pseudotsuga Tax. | 25.1 | 0 | 0 | 0 | 25.1 |
| Total | 25.1 | 264.9 | 0 | 0 | 290.0 |

° Non contemplated at present.

6. Seed collection and extraction.

(a) Collection, extraction and costs.

No seed was collected or extracted this year.

(b) Inventory of seed.

No seed remains on hand. All seed has been sent to the Monument Nursery.

7. Experiments.

(a) Completed during the year.

1. Shading of 1-0 seedlings. This experiment was carried out on a small scale last year, and the results warrented continuation of the experiment on a larger scale. This year the thought was to try shading half the beds all of the season and the other half until germination was completed. However the beds on which this same experiment was tried last year showed so much difference at the time the shade was to be removed from the 1-0 trees that the experiment was dropped in favor of shading the whole season. At the end of the second year the 2-0 beds on which the shade was left on longest show a pronounced difference in developement. As no more seeding is being done at this nursery the experiment will be dropped for good.

2. The experiment on watering of beds inthe daytime versus at night. Due to the number of nights when the temperatures dropped to the freezing point or close to it, most of the watering was done during the day. The only difference found is in the amounts of water needed to secure the same penetration. In the event that there was a shortage of water, it would seem advisable to do as much of the watering as possible in the evening.

3. It had been proposed to experiment with the drilling of seed, but as no more seeding is being done the experiment was not undertaken.

(b) Proposed.

An experiment is now in progress to detremine the feasibility of doing the digging of trees to be distributed in the fall instead of spring.

The experiment is being carried out on a small scale this year, and probably next year will be carried out on a much larger scale. It has not been felt that digging and healing the trees in for the winter justified itself as the added cost of the healing process offset the cost of the winter protection. This may not be true, but it was to be considered. The thought we must bear in mind here is the possibility of making the trees available for the field sooner.

An accidental finding this spring during the planting season; the finding of a bundle of trees in the water since the spring of 1937, has given us the idea that perhaps there might be a possible clue to our problem. This bundle of trees,approximately 100, was found totally submerged. It is not known whether or not they had been submerged the full time or not, but, and this is the important thing,87 of them were still green, and 24 showed new root growth. With the idea of doing our heeling-in in water bundles of 50 of each species were made this fall, and one bundle of each species so made was totally submerged, and one of each was heeled-in by just submerging the roots. Next spring at the time of planting these trees will be planted on sites suitable for the species and a comparison with trees dug from the beds will be made. No costs can be kept on so small a scale, but if we are successful in the experiment it will be tried on a larger scale so that costs can be kept.

(c) Weather Data.

Weather records for Pole Mountain are still not complete enough to give a figure for normal, however the average for the number of years the records have been kept gives us a comparison.

Temperatures this season were very eratic, temperature ranges ran as high as 46° daily. In every month there was at least one day when the daily range was over 40°. In June we had the hottest and the coldest temperature. The temperature reached a high of 88° and a low of 20° in that month. While more days with temperatures in the 80's was recorded this year, we also had at least three days a month with the temperatures dropping below the freezing point.

Precipitation during the season was much below any previous year including the drouth of 1934. From June 10 to September 5 the total precipitation for Pole Mountain was 1.36 inches. The drouth this season caused the main strems here to dry up. The beaver ponds were full, but below the ponds the streams were dry. We were very fortunate in not running short of water for the nursery. The new water developement never dropped under 20 gallons per minute, and at the beginning of the season was running 80 gallons.

For table of temperatures and precipitation see next page.

POLE MOUNTAIN WEATHER DATA
1 9 3 9

Data taken from U.S.Weather Bureau publication Climatological Data.

| Month | Temperature Data | | | | Precipitation (inches) | |
|---|---|---|---|---|---|---|
| | Mean Max. | Mean Min. | Mean Temp. | Departure From Normal ° | 1939 | Departure From Normal ° |
| December °° | 27.0 | 11.0 | 19.0 | - 4.9 | 1.26 | .51 |
| January | 25.0 | 11.0 | 18.0 | - .6 | .74 | .00 |
| Februray | 18.1 | .8 | 9.4 | - 10.5 | 1.15 | .34 |
| March | 34.8 | 15.5 | 25.2 | .1 | 1.23 | - .02 |
| April | 44.9 | 22.5 | 33.7 | .9 | 1.90 | - .87 |
| May | 57.4 | 31.6 | 44.5 | 2.7 | 2.22 | - .54 |
| June | 65.1 | 35.2 | 50.2 | - 2.4 | 1.18 | - .40 |
| July | 76.3 | 42.7 | 59.5 | - .8 | .53 | - 1.39 |
| August | 70.7 | 40.4 | 55.5 | - 3.0 | .40 | - 1.18 |
| September | 63.8 | 37.0 | 50.4 | 0.0 | 2.06 | .88 |
| October | 50.9 | 25.8 | 38.4 | - 2.0 | .64 | .00 |
| November | 43.1 | 20.5 | 31.8 | 4.4 | .01 | - .56 |
| | | | | | Total precipitation for year 13.32 | |
| | | | | | Excess or Deficiency | - 3.23 |

° No Normal figures established for Pole Mountain, figures used are averages for past eight years.

°° December 1938 figure. December 1939 not available for this report.

From the above precipitation figures it can readily be seen that a lack of precipitation was recorded for the year, especially during the critical growing period.

8. Protection.

(a) Rodents.

Mice. No damage from mice was found this year. Seed beds sown of 1938 were covered with a layer of pine needle mulch until germination had started. No fail spots due to mice were found. Control is by poison. During the fall after the mouse fence has been erected the area is gone over and poison is spread around the fence and around the mulched area. Poison is also spread around the various buildings.

Gophers etc. No gopher damage occurred this year, but a diligent crusade against them was carried on at all times in the nursery area. It has been noted that the gophers do not seem to do any damage where the ground is sufficiently moist. However in the idle areas plenty of these pests were found and killed. Castor beans were placed in some of the holes and it is believed some effective control was had from this method. Shooting them and then poisoning the carcass was also very effectivein control.

Rabbits. No damage from rabbits could be found this year. Very few were seen in the vicinity of the nursery until after the winter protection had been put on. It has been found that care must be taken in mulching of the beds to see that no holes are left as an inducement for the rabbits to locate there. Inspection of the beds frequently will show rabbit entry if there is any.

Porcupines. While this rodent has not been found to do any damage to the nursery stock, some damage has been found in the nursery area in one of the experimental plantations. Four of these porcupines were killed this year in the nursery area, and some damage found. It is hoped that some kind of control work can be carried on this winter even if it amounts to nothing more than hunting them in the snow.

(b) Other protection.

Hail protection. No hail storms of any intensity were recorded this year, and no doubt this was due to the extreme drouth conditions. Hail screens were erected on all seedling beds where the regular protective frames were not in place. These frames are the ones described in the Annual Report for 1938.

9. Improvements and Equipement.

(a) Equipement purchased and constructed 1939.

1. Last fall a tree balerwas secured from the Monument Nursery and with it as a model another baler was constructed at Pole Mountain. No materials were purchased for the construction as the necessary materials were on hand, The baler constructed here was changed somewhat from the model. The principal changes were in making a removable top piece so that when the bail was to be tied it could be turned out of the way and the tieing machine could then be used without interference. This improvement is not necessary where bales are tied with bands, but in the use of the Girard wire tieing machine it is of great help. See photos in this report. — Now included 24

2. A culling table was constructed this year in order to take care of the culling and grading of transplants. This table was made from materials on hand and no special outlay was necessary. The table can easily be taken apart and the material used for other purposes if desired. The table is covered with six layers of burlap and the burlap is kept moist when in use. Eight men can work at the table very comfortably.

No other construction took place and no materials were purchased for other purposes this year.

(b) Comments on new developements, uses, and future needs.

1. A tree digger for seedlings is to be used next spring. Arrangements have been made to borrow one from the Monument Nursery for this purpose. It is felt that with the size of the transplant program for next spring that it will be well worth obtaining such a piece of equipement.

2. In view of the present plans to discontinue the nursery here no new equipement or other developement work is felt to be necessary. Previous plans to secure a tractor and to develope more area have been abandoned.

10. Labor supply.

(a) Supply, suitability etc.

All work at the Pole Mountain Nursery was done with CCC labor. This labor was furhished from the Pole Mountain side camp which is established at the nursery. The work consisted of all phases of nursery work with the exception of seed sowing and seed bed preperation. The work done by the CCC consisted of uncovering the beds in the spring, distribution including culling, transplanting, general maintenance of the nursery consisting mostly of weeding. Winter protection of the trees and the erection of the mouse fence around the area was the fall work as no seeding was done.

It is felt that the CCC done a very good job and this is due in a large way to the excellent supervision of the enrollees by their forman Mr. Berglund. In the transplanting work one local man who had transplanted last year was taken from the field planting job and put on the transplanting job as a boardman. The idea was to have him act as a sort of lead man and instructor. The system worked very well as the CCC boys were always trying to outdo themselves to transplant more trees per day. Both crews were running between 30 and 35 thousand a day. The difficulty now lies in the fact that none of the boys used on the transplanting this Year will be available for next year.

(b) Recommended changes.

No changes are recommended in the labor use at this nursery. As long as the CCC are available at the nursery it is felt that they should be used for the duration of the job.

11. Costs.

(a) Comparison of Costs by years per M trees.

| Project | 1939° | 1938 | 1937 | 1936 | 1935 | 1934 | 1933 | 1932 | 1931°° |
|---|---|---|---|---|---|---|---|---|---|
| 1 Yr. Seedlings: | 1.349 | 1.334 | 1.851 | 7.636 | 4.729 | 5.144 | 5.39 | 2.01 | 2.25 |
| 2 Yr. Seedlings: | .520 | .641 | 1.109 | 6.515 | 5.145 | 3.261 | 6.45 | 2.53 | 11.02 |
| 1 Yr. Transplants: | 3.227 | 3.670 | 5.223 | 12.836 | 5.959 | 4.835 | 9.15 | 6.59 | 9.54 |

° See Summary Sheet column 20 at end of this report.
°° No previous production.

(b) Allotments by projects, Fiscal Year 1940

No allotment has been made for the present fiscal year, the plan being to run the nursery as a CCC project. If this should be discontinued on or about March 31 an allotment as shown will be needed.

| | |
|---|---|
| First Year Seedlings | $ 00.00 |
| Second Year Seedlings | 100.00 |
| Transplants | 500.00 |
| Distribution | 200.00 |
| Total | $800.00 |

(c) Allotment Estimate Fiscal Year 1941

If the continued use of some form of relief labor is not possible after June 30 of this year an allotment as shown below will be needed.

| | |
|---|---|
| Maintenance of nursery | $750.00 |
| " " improvements | 50.00 |
| " " equipement | 50.00 |
| Total | $850.00 |

(d) Comments on costs:

Cost figures contain labor charges for CCC enrollees, CCC foreman, and forest officers time. Only one man was used this year with P&A money and that was for transplanting. It seems well to use one man of local labor when transplanting is being done to act as a guide for the CCC enrollees when leaders are not available as is the case in side camps. We were fortunate this year in getting a very good bunch of boys on the transplanting job.

All other phases of the work aws carried on entirely with the CCC labor from the side camp here.

The cost of 1-0 stock this year is very close to last years figure, and it is felt that with the present number of trees being produced that this is approximately as low as can be reached. The cost of 2-0 seedlings shows a decrease in cost and this is due to the number as compared with other years. In the transplants the costs have also been lowered and this is felt to be due to the saving in the transplanting job, and no doubt would have been still lower had there been a number comparable with the present 1-0 and 2-0 seedlings transplanted.

The cost for distribution this year shows an increase over last year. This is due to the fact that all trees were culled for size and root developement before shipment. The trees were also wrapped in bundles as they were culled. This culling increased the cost of distribution by 17¢ a thousand. If this extra cost had not been included a decrease in the distribution costs would have resulted. It is felt that the culling cost can be very much reduced in the future as more efficiency is applied to the job.

The trees to be distributed this spring will be the first trees which were raised from seed by the present nurseryman, and the costs show a very marked decrease. An exception to this is the Picea engelmannii 3-1 stock which was not started by the present nurseryman and had an excessive charge aganst it the first year of $7.36 per M.

Trees to be distributed in the spring of 1941 will be approximately $6.00 for 2-1 transplant stock, $6.50 for 3-1, and $4.00 for 3-0 stock. These figures all include the cost of distribution.

It is felt that very much progress has been made at Pole Mountain in the past few years both in the production and in the cost of stock. In a way it is a bit discouraging to have the nursery closed after showing that it is possible to produce a given amount and at not too higha cost.

S
Nurseries

# STATEMENT OF NURSERY COSTS

Pole Mountain Nursery, Region 2

C.Y. 19--39-----

| Projects (1) | Number of Trees M (2) (a) | Basis for Distribution of Minor Project Costs: Man Hours (3) | Animal Hours (4) | Tractor & Pump Hours (5) | Auto Miles (6) | Direct Charges: Amount (7) | Per M (8) | Preliminary Distribution of Minor Project Costs: Proj. #7 (9) | Proj. #8 (10) | Proj. #8a (11) | Proj. #8b (12) | Charges Deferred to Future Years (13) | Deferred Charges from Previous Years (14) | Direct Distribution of Minor Proj. #6 (15) | Distribution of Depreciation (16) | Net Cost of Minor Projs. to be Prorated (17) | Final Proration of Minor Proj. Costs to Major Projs. (18) | Total Cost Major Projects: Amount (19) | Per M (20) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1st.Year Seedlings | 487.7 | 1237½ | | | 42 | 301.16 | .618 | | 2.45 | | | | (d) 110.56 | 4.36 | 121.97 | | 117.20 | 657.70 | 1.349 |
| 2nd Year Seedlings | 473.8 | 570 | | | 4 | 150.46 | .294 | | .26 | | | | | 4.62 | 56.17 | | 53.98 | 265.49 | .520 |
| 3rd Year Seedlings | 37.1 | | | | | | | | | | | | | | | | | | |
| 1st Year Transplants | 264.9 | 1847½ | (b) | | 5 | 487.81 | 1.84 | | .32 | | | | | 9.68 | 182.07 | | 174.97 | 854.85 | 3.227 |
| Distribution 5 | 317.4 | 614½ | | | | 171.73 | .541 | | | | | | | | 60.57 | | 58.20 | 290.50 | .915(h) |
| " 5a | 75.0 | 214½ | | | 28 | 57.87 | .771 | | 1.26 | | | | | | 21.14 | | 20.31 | 100.58 | 1.328(h) |
| | | | | | | | | | | | | | | | | | | | |
| **TOTALS** | | 4484 | 0 | 0 | 79 | 1169.03 | | | 4.29 | 0 | | 0 | 110.56 | (e)18.66 | (f)441.92 | | (g)424.66 | 2169.12 | |
| Soil Fertility | | 11 | | 14 | | 8.58 | | | | 10.08 | | | | | | | | | |
| Motor Vehicles-Stake | .065 M | | | | | 26.41 | | | | | | | | | | | | | |
| Pickup | .045 M | | | | | | | | | | | | | | | | | | |
| Tractor | .72 Hr. | | | | | 10.08 | | | | | | | | | | | | | |
| Pump | .085 Hr. | 12 | | 387(c) | | 42.28 | | | | | 42.28 | | | | | 42.28 | | | |
| Administration | | 143 | | | 400 | 111.54 | | | 18.00 | | | | | | | 129.54 | | | |
| Maintenance | | 541 | | | 80 | 248.72 | | | 4.12 | | | | | | | 252.84 | | | |
| Investments | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | |
| **TOTALS** | | 707 | | 401 | 480 | 447.61 | | | 22.12 | 10.08 | 42.28 | 0 | 0 | | | (g)424.66 | | | |
| | | | | | | | | | | | | | | | | | | | |
| **Grand Total** | | 5191 | | 401 | 559 | 1616.64 | | | 26.41 | 10.08 | 42.28 | 0 | 110.56 | | | 424.66 | 424.66 | | |

(a) Includes CCC Labor @ 1.50 for 7 hour day, CCC Foremen's F.O. time at actual wages and 1 P&M man during transplanting @ 50¢ per hour.
(b) Includes 1 P&M man for transplanting @ cost of $20.00.
(c) High number of pumping hours due to drouth.
(d) Deferred charge from 1938 for sowing of O-O beds.
(e) Cost of soil fertility distributed on basis of 28,713 sq. ft. in beds, which equals $0.00065 per sq. ft.
(f) Taken from Forms 21j and distributed on basis of 4484 man hours worked on Projects 1-5, which equals $0.09855 per man hours.
(g) Distributed on basis of 4484 man hours worked on projects 1-5 which equals $0.09470 per man hour.
(h) Cost includes $.17 per M charge for culling and bundling.